I CLAIM:

- 1. A semiconductor processing apparatus comprising a reaction chamber and one or more vitreous components having an outer surface that is covered at least in part by a devitrification barrier coating.
- 2. The apparatus of Claim 1, wherein said one or more vitreous components are formed from quartz.
- 3. The apparatus of Claim 1, wherein said devitrification barrier comprises silicon nitride.
- 4. The apparatus of Claim 1, wherein said devitrification barrier coating is formed from silicon nitride that has been deposited on said one or more vitreous components using CVD deposition.
- 5. The apparatus of Clarm 1, where said devitrification barrier coating has a thickness between about 1 and 10,000 angstroms.
- 6. The apparatus of Claim 5, where said devitrification barrier coating has a thickness between about 50 and 5000 angstroms thick.
- 7. The apparatus of Claim 6, where said devitrification barrier coating has a thickness between about 500 and 3,000 angstroms thick.
- 8. The apparatus of Claim 7, where said devitrification barrier coating has a thickness of about 800 angstroms thick.
- 9. The apparatus of Claim 1, where said devitrification barrier coating is formed from the group consisting of silicon nitride, diamond, titanium nitride, titanium carbon nitride, and combinations thereof.
- 10. The apparatus of Claim 1, wherein said devitrification barrier coating covers an entire portion of said outer surface of said one or more vitreous components.
- 11. The apparatus of Claim 1, wherein said devitrification barrier coating only covers a portion of said one or more vitreous components that is most susceptible to devitrification.
- 12. The apparatus of Claim 1, wherein said wherein said devitrification barrier coating covers at least a portion of a quartz sheath of a thermocouple.
- 13. The apparatus of Claim 1, wherein said apparatus further comprises an upwardly extending projection positioned on a support device, said projection and

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support device configured to support a substrate within said apparatus, said projection being covered at least in part by said devitrification barrier coating.

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- 14. The apparatus of Claim 1, wherein said reaction chamber is a chemical vapor deposition reaction chamber.
- 15. A thermocouple configured for use in a chemical vapor deposition process chamber, said thermocouple comprising:

thermocouple wires;

- a vitreous sheath surrounding the wires; and
- a devitrification barrier coating covering at least a portion of said sheath.

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- 16. The thermocouple of Claim 15, wherein said vitreous sheath is formed from quartz.
- 17. The thermocouple of Claim 16, wherein said devitrification barrier coating comprises silicon nitride.
- 18. The thermocouple of Claim 15, where said devitrification barrier coating has a thickness between about 1 and 10,000 angstroms.
- 19. The thermocouple of Claim 18, where said devitrification barrier coating has a thickness between about 50 and 5000 angstroms thick.
- 20. The thermocouple of Claim 19, where said devitrification barrier coating has a thickness between about 500 and 3,000 angstroms thick.

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- 21. The thermocouple of Claim 15, where said devitrification barrier coating is formed from the group consisting silicon nitride, diamond, titanium nitride, titanium carbon nitride and combinations thereof.
- 22. The thermocouple of Claim 15, wherein said devitrification barrier coating covers an entire portion of said thermocouple.

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- 23. The thermocouple of Claim 15, wherein devitrification barrier coating covers a portion of the thermocouple that is most susceptible to devitrification.
- 24. The thermocouple of Claim 15, wherein devitrification barrier coating covers a tip of said thermocouple.

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25. A method of minimizing divitrification in one or more vitreous components of a chemical vapor deposition process chamber, said method comprising the step of coating at least a portion of said one or more vitreous components with a

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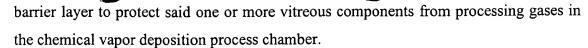
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- 26. The method of Claim 25, wherein coating at least a portion of said one or more vitreous components with a barrier layer includes using chemical vapor deposition to form said barrier layer.
- 27. The method of Claim 25, wherein coating at least a portion of said one or more vitreous components includes forming the barrier layer from silicon nitride.
- 28. The method of Claim 27, wherein said step of forming the barrier layer out of silicon nitride includes using chemical vapor deposition to form said barrier layer.
- 29. The method of Claim 27, wherein said step of forming the barrier layer out of silicon nitride includes forming said barrier layer such that said barrier layer has a thickness between about 1 and 10,000 angstroms.
- 30. The method of Claim 29, wherein said step of forming the barrier layer out of silicon nitride includes forming said barrier layer such that said barrier layer has a thickness between about 500 and 3,000 angstroms thick.
- 31. The method of Claim 25, wherein coating at least a portion of said one or more vitreous components with a barrier layer includes forming the barrier layer from the group consisting of silicon nitride, diamond, titanium nitride, titanium carbon nitride, and combinations thereof.
- 32. The method of Claim 25, wherein coating at least a portion of said one or more vitreous components includes coating at least a portion of a thermocouple sheath.
- 33. The method of Claim 32, wherein coating at least a portion of said thermocouple includes coating a portion of the thermocouple sheath that is most susceptible to devitrification.
- 34. The method of Claim 32, wherein coating at least a portion of said thermocouple sheath includes covering a tip of said thermocouple sheath.
- 35. The method of Claim 32, wherein coating at least a portion of said thermocouple includes covering a portion of the thermocouple that is near a susceptor of said chemical vapor deposition process chamber.
- 36. The method of Claim 25, wherein coating at least a portion of said one or more vitreous components includes coating an entire portion of a thermocouple sheath.

- 37. A chemical vapor deposition apparatus comprising a thermocouple, said thermocouple comprising thermocouple wires; a vitreous sheath surrounding the wires; and means for minimizing devitrification in said thermocouple.
- 38. The apparatus of Claim 37, wherein said means comprises a silicon nitride coating.
- 39. A support device configured to support a susceptor in a chemical vapor deposition chamber, said support device including a plurality of arms, each of said arms having a distal end configured to directly contact and support said susceptor, said distal end being covered at least in part by a devitrification barrier coating.
- 40. The support device of Claim 39, wherein said support device includes three arms.
- 41. The support device of Claim 39, wherein said distal end comprises an upwardly extending projection.
- 42. The support device of Claim 39, wherein said distal end is formed from quartz.
- 43. The support device of Claim 39, wherein said devitrification barrier coating comprises silicon nitride.
- 44. The support device of Claim 39, where said devitrification barrier coating is formed from the group consisting silicon nitride, diamond, titanium nitride, titanium carbon nitride and combinations thereof.
- 45. The support device of Claim 39, wherein said devitrification barrier coating covers an entire portion of said distal end.

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